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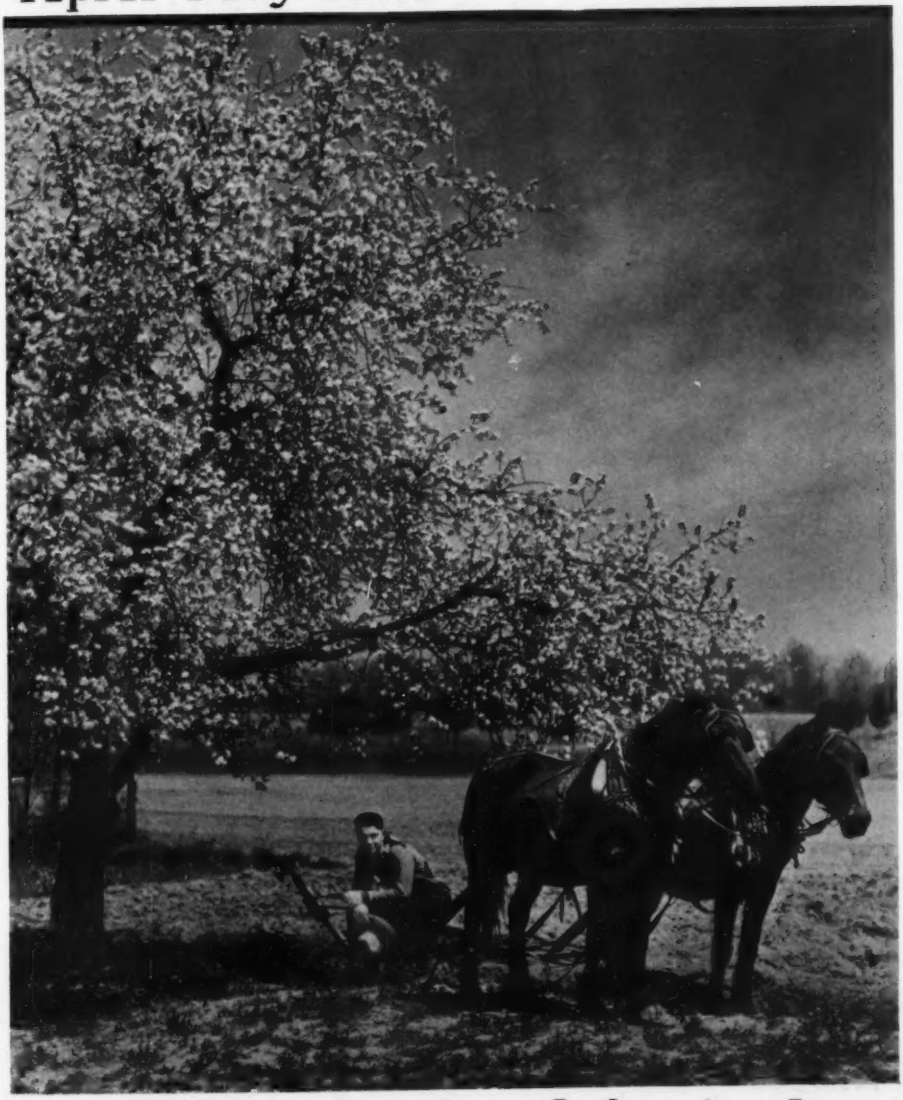

The Pocket Book of Agriculture

PLANT NUTRITION DIAGNOSIS "CASE BY CASE"

Fertilizing in time of depression is discussed in an article in the January issue of the "International Review of Agriculture." The point is brought out that *"the question should be examined case by case, rather than as in the past, based on broad generalizations of plant requirements and on the supposed content of soils in fertilizer principles."*

As the need for efficiency in farming operations everywhere becomes more urgent it is possible that this general policy of examining the farmers' soil and crop problems "case by case" will become more necessary. Under such conditions, the various methods of diagnosing the nutritional needs of soils and crops will become more important.

N. V. POTASH EXPORT MY., Inc., 19 West 44th Street, New York

Better Crops with PLANT FOOD

The Whole Truth—Not Selected Truth

R. H. STINCHFIELD, *Managing Editor* SID NOBLE, *Editor*

Editorial Offices: 19 West 44th Street, New York

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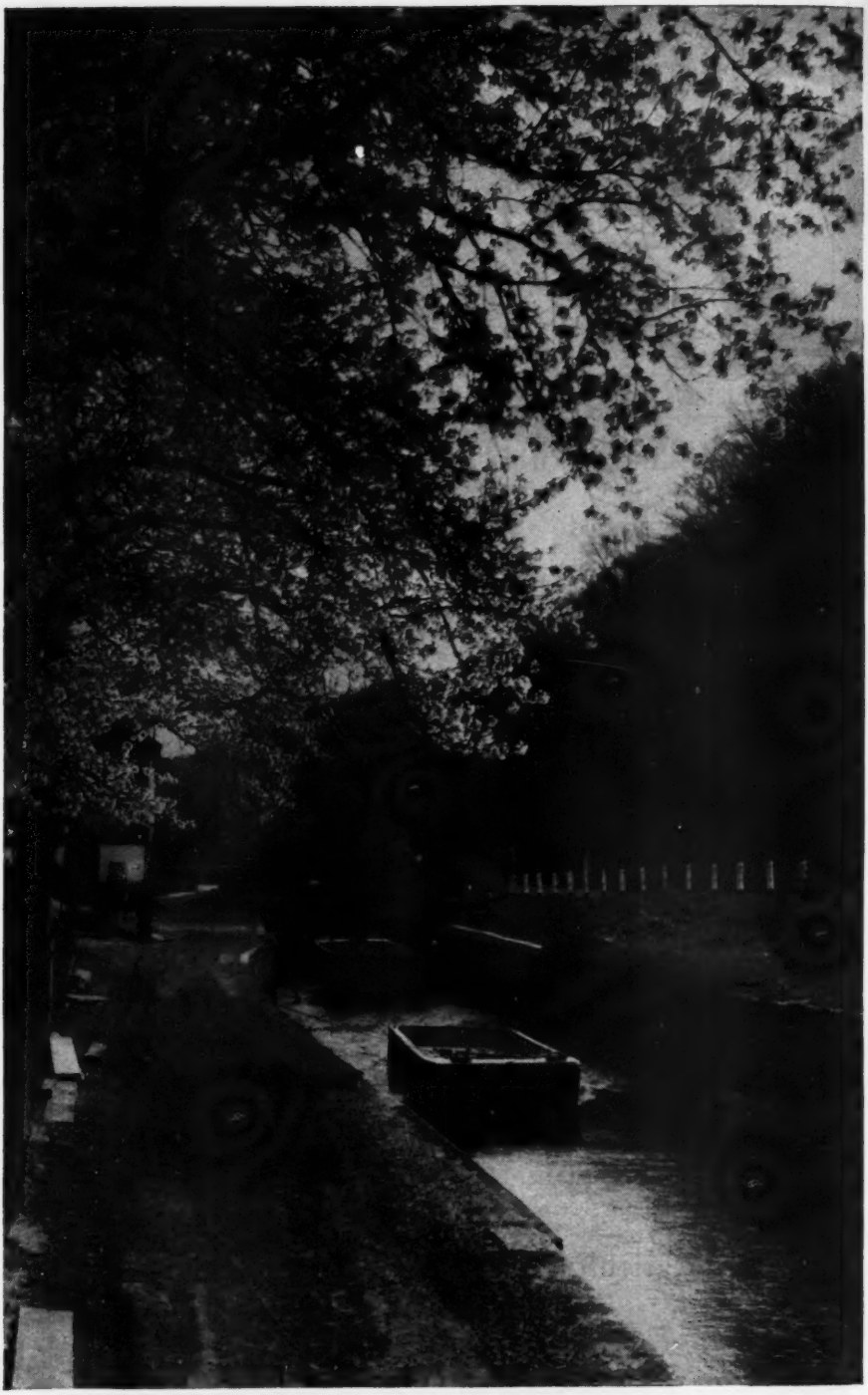

A PICTURESQUE SPOT ON A CANAL NEAR EASTON, PENNSYLVANIA

Better Crops with PLANT FOOD

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Are you, with Jeff,—

Country-Minded?

By Jeff McDermid

TO be country-minded and be chained and riveted to city living when the spring blooms afield is woe indeed! A person thus situated combines the feelings of one who misses a train, commits an error, and loses his best girl.

They say that an expatriate is one who is absent by choice, while an exile is one who is absent by compulsion. City slaves of rural origin belong to both classes. Then there is of course a third class to consider. To this class belong those who never lived in the country and yet who yearn for it constantly when they can find the time for yearning on Sundays and after six o'clock week days. Theirs is either an inherited or an acquired distaste for the smother and grime of brick and mortar, cement and sameness.

Some of these devotees of a life they have never enjoyed or experienced assume a freakish semblance to us who know that country life is not all butterflies and cream, glowing sunsets and dewy mornings. Their temperament for open spaces sometimes suggests a strait-jacket, but withal there is some-

thing divine and mystic about the way in which that germ of rebellion became implanted in their souls. True, it sometimes gets rubbed out when they invest in chicken ranches or try suburban farming on an ambitious but fruitless scale. Even though their imagery leads to a delusion and a snare, we of the country in bone and marrow secretly applaud them for overcoming the thralldom of the city.

THE well-known and much economized example of the "swing to the city" (during the commercial era of profit above planting) caught in its ebb-tide those who went by choice as well as those who went by compulsion. It is sometimes hard to say exactly whether it was the city which attracted or the country which repelled. But we do know that from 1920 to 1929 the compelling force was greater somehow than the free-choice element, and thousands of them went from pastures to pavements and seemed to like being street-car conductors and clerks better than being hired men and town chairmen. Naturally some of them became captains of industry after awhile and then lost their last nickel down a crack in the sidewalk playing craps with some other gambler. They could have sunk it just as well in wonderberries or sure-sex chick investments out on the old farm, but the excitement was greater amid the bright lamps, and the county poor farms were overcrowded anyhow.

Folks were driven from the farms, or lured therefrom during the drab decade and for awhile they appeared happier. Then groceries got scarce and they recalled the cellar at home filled with juicy jams and hams, and the mooley cow begging to be relieved of her lactic flood. The retrograde movement set in and has kept up a steady pace, they tell me in the Agricultural Annex, until dim signs of recovery stirred the star boarders on the farm to hang up their borrowed overalls. We now discern another timid movement once more toward the city, a sort of skirmish as it were, to see how real the recovery may be before forever letting go of the meal ticket back on the farm. This leads us to say on the side that farm relief in the past three years has been much in the nature of succor for the suckers.

To some city-bred folks "country-minded" means being ornery and unwilling to cast thoughts in a definite mold or standard pattern. It means being pernickety or stubborn, unbending to novelties, resistant to modernity, inconsistent and untamed. In illustrating this scrambled idea of theirs they point to cooperative squabbles and the insistent and never-satisfied cry for farm relief and equality, while they say that every township has its own peculiar and unworkable scheme for rural salvation.

THEY dub it being "country-minded" when it is only a very human trait amplified by environment and native habits. The country daisy may be as much a flower as the city orchid and subject to the same conditions of growth or decay.

They forget that the farmer is like the poet's description of youth when he says "the thoughts of a boy are long, long thoughts." Habits of rural life may not be conducive to technical education, but they do induce retrospective thinking and stir visions of broad human equality and freedom. As another poet has said, the farmer is in a position to hear sermons in stones and books in the running brooks. Even as expressed in the Ode to Immortality, the farmer is like a child in his nearness to the vital, the ultimately real, and the purest verities of life. Maybe he never grows up to become as skeptical of immaterial things as city folks are, but you can't fool him on the substance of permanent values.

It has been so often the case that people with plans afoot for wide campaigns would insist on "talking

plain to farmers, using their own language," that we get the impression that folks with country minds are a race apart. What does that signify? Does that mean shying from allegory or sentiment or truth? Does it mean sticking to the dollar sign and class prejudice for a country appeal?

I believe that it means opening the windows of the mind to let in fresh air from the meadows. It means using sound seeds of truth and planting them not too thickly. It means the gentle rain of sincerity and the sun-

shine of understanding. Words of this kind provide messages which cause sprouts to grow in any rural environment.

I have seen as many dismal failures on the part of country-bred exiles who attempted to get messages over to farmers as I have of those who never had the privilege of knowing the "mother tongue" of the soil. What can be more disappointing than the eruption of a learned graduate or doctor who tries to plot cycles or chart curves on the vagaries of untamed nature? Especially a farm-raised collegiate!

What is there about being country-minded that gives such a fraternity of feeling to folks who rejoice openly in their rural origin?

What is it that makes such men come from city offices with a smile when rain follows a dry spell and makes them scan the skies like sailors during hay time?

Memory is the only answer. Even though a man may have the most arid recollections of his boyhood in the back country or of his overworked youth and his jaded mother, the wealth of feeling for the forces of nature in the open country is bound to claim him as their own.

Show us how any similar power exists to pull a city man's interest back to Hogan's alley when he smells a goat or hears a beer wagon rumble by his door. You may move from the country, but you can't shut its images and sense impressions out.

YOU can take any topic under the sun, almost, and test it out under the influence of country-minded memory. The power of that early environment to color the ways you approach a subject is amazing.

Take religion or piety, self-control or decency—whatever you may choose to classify this moral fiber of a fellow's nature—it has deep roots in the memory of country minds.

Perhaps the country has changed in the meantime, so that no longer are the old, brown wooden sheds near the white meeting house, filled with horses and wagons on somnolent summer Sundays. Perhaps the old, grass-grown churchyard with its broken tombstones no longer brings the elegy to mind as slow-footed, bare-legged boys trudge by it on their way to Sabbath school. Maybe the high-power clergyman and the vested choir in the city fifteen minutes and ten seconds away have reduced the old rural collection plate to an empty sham. Even so, I still hear the fiery tones of Elder Brown, the snores of my weary Father, and I see once more that which gave me more religion than I have been able to retain—the soft brown eyes and golden curls of a Daughter of the Parish, whose presence was a benediction and whose departure was a blight.

Take Labor, which the Good Book specifies carries its own just and sure reward! What attitude towards it have the country-minded out of their hazy and oft unconscious memory of things long past?

I think it has seldom bred clock-watchers and time-servers. Perhaps that is why so many have observed that the city is so full of successful folks who originated in the country. Likewise that is why farm life has been willing to remain "underpaid," and has not asked for union hours. That is why we cannot prove cost of production in man hours at every turn of the dial in the country. So much of our work on farm lands is really a tribute to the life itself, to the pulse of nature, dedicated to the task done to a finish rather than to the tune of a paymaster. That is why our memories of the hired man and the hired girl blend so closely with our own family life instead of being some remote tool of profit-making such as city employees become.

BUT this ingrown custom of taking labor as part of life itself and accepting it as inevitable, which has marked country living for ages, may in itself indicate a weakness. I am not sure what the answer may be. It seems extremely difficult to wean country-minded folks, either in rural homes or in cities, from the idea that leisure is laziness. Labor is religion to them. It is not, as some suppose, because of the pecuniary reward alone that comes from such drudgery from dawn to darkness. If that were the only cause of country-minded attitude toward labor the lesson of the past ten years would have erased it long since. There has been so little reward in country labor—aside from the mystical, spiritual, intangible rewards that return with each spring seeding—that I am sure we can prove nothing by following that course.

I maintain that in farm life alone there remains some vestige of man's original "sentence" to labor in the Garden, so that all the power of the prophets and the influence of Government finances cannot completely overcome it. Take one acre away, remove one cow, shorten one hour, lighten one burden, and the farmer and his wife are uneasy until once again their time is fully occupied. The only way we can ever make submarginal lands void of the cultivator is to make them reservations with penalties for doing anything thereon except scatter egg-shells.

Take neighborliness! No single aspect of human affairs belongs so much to the country-minded as that. Perhaps with the radio and the flivver in our midst these days there is not the urge for reunions of families and friends in farming communities that existed before. But where is there a country-minded person stifled inside a city "flat" who has not wondered how people under the same roof could so long remain ignorant of each other, and so "leery" of a little friendly gossip? I could not describe one of my fellow apartment dwellers, but my Mother could spin such delightful and humorous descriptions of the town selectmen and the newcomers from Iowa and all their foibles that they seemed like characters in fiction. Knowing and seeing your neighbors, which is after all worth a great deal in life, seems to be an art of special development in the country-minded. I guess they saw comparatively few people and had lots of time to sort them over in their minds. We see hundreds daily and forget half of them.

HOW about economics? This is a touchy subject with many angles to it and one that might well take a volume to spin out. I often think that country-minded people accept economics as a necessary evil, because they know that hard labor and sentiment rule the open country anyhow, and that statistical sermons bring on the shut-eye. Sons of the soil sometimes forget it, however, and insist on reeling off doses of embalmed conclusions deduced from historical inferences.

It has been said with some truth that the only economics that appeals

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Balanced Fertilizers *as an* Aid *to* Better Keeping Quality *of* Fruit

By M. B. Davis, Dominion Horticulturist

Reprinted from Canadian Horticulture and Home Magazine, April, 1934

INSTEAD of judging the results of our fertilizer treatments entirely by yield and growth records, it seems far more reasonable to also consider the quality of the fruit on the tree and keeping quality of the fruit after it has been picked. A large crop of poor-keeping fruit is of little value to any person.

The proper date of picking and proper storage conditions may be used to influence the keeping quality of apples, but fertilizer and cultural practices during growing have a greater effect. Proper picking dates may, of course, iron out some of the ill results of faulty nutritional treatment, but it is doubtful if all ills due to bad fertilizer practice can be ironed out in this manner.

Whilst there are numerous cases of orchards very high in nitrogen producing good-keeping fruit, and cases of where experiments show that high nitrogen feeding has not interfered with keeping quality, it has been our general experience that high nitrogen feeding and possibly high nitrogen and phosphorus feeding are the two greatest factors in destroying the keeping quality of apples.

We have found that we are able to overcome the ill effects of high nitrogen by the addition of potassium in so far as vegetatation is concerned. I wish now to impress on you that a highly vegetative plant, making excellent growth and possessing good-looking foliage, is not necessarily a plant capable of producing good-keeping fruit. This can best be explained by referring to tomatoes for a moment. We can produce a perfectly marvelous tomato plant, with a perfectly marvelous crop of tomatoes, by forcing it with plenty of nitrogen and plenty of minerals or even just plenty of nitrogen and plenty of potassium, but if we force it too much, all the fruit is diseased with blossom end rot, due entirely to too much nitrogen which no amount of mineral feeding will offset.

The same holds true of orchards under forced feeding of nitrogen. A practical example will make this point clearer.

In one of the orchards we have had

under observation for some time there is a block of Fameuse and McIntosh 16 years old. One section has been mulched and heavily nitrated for several years. The foliage is very luxuriant and the trees are making excellent growth. The other section has been in sod and very rarely receives any fertilizer. The trees here show signs of low nitrogen, but not enough to get excited about, and they are making very moderate growth. The fruit from the sod section keeps perfectly free from premature breakdown or decay, whilst the fruit from the heavily mulched or nitrated section is very subject to premature internal browning and spoilage. I could multiply this example many times until one would be forced to conclude that on the whole a low-nitrogen orchard is capable of producing better keeping quality fruit than one being fed large amounts of that element.

We are perfectly aware of the fact that there are experiments in America to show that nitrate applications do not materially interfere with the keeping quality of apples. This might indicate that under these conditions available nitrogen for the time-being has been very low, while available minerals have been high. The South African workers, in criticising these experiments, claim a balance between nitrogen and phosphorus is essential; that if phosphorus is available in large amounts then heavy nitrogen feeding can, to a certain extent, be given without interfering with the keeping quality of the fruit. If, on the other hand, phosphorus is not present in sufficient quantity, the same amount of nitrogen will result in poor keeping quality.

It is necessary then to consider the nitrogen-phosphorus balance in relation to keeping quality.

We have found that there is a phosphorus-potassium balance in which an excess of phosphorus may interefere with potassium intake and bring about troubles in the form of low vigor, leaf scorch, low yields, and poor quality. There is also some evidence that excess phosphorus can induce poor keeping quality and further evidence that this is due to a relationship between phosphorus and nitrogen and potassium.

Table 1 will indicate this a little more clearly:

TABLE 1.

	Per cent spoilage from internal browning.
9 nitrate only	32
9 nitrate—6 slag	12
3 nitrate—6 slag	100
9 nitrate—6 slag—3 potash	0

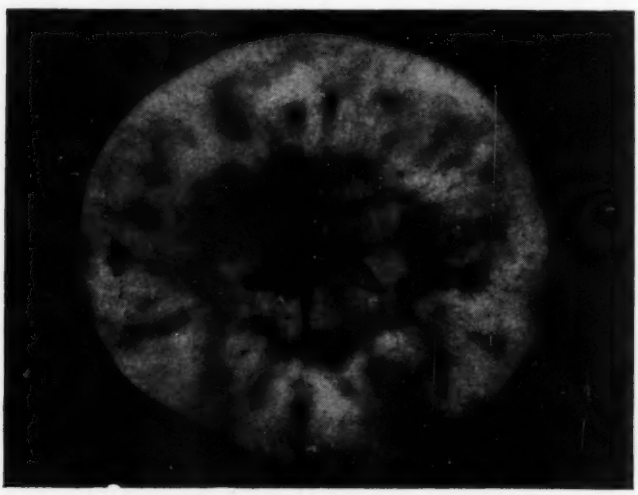


Fig. No. 1—Apple injured by internal cork areas.

You will note that where nitrogen has been fed alone, the spoilage due to core flush has been considerable, *viz.* (32%); but that where nitrogen has been fed in conjunction with a reasonable amount of slag, this has been reduced to 12%; where an excess of slag over nitrogen has been used, it has jumped up to 100%; and that

where a reasonable balanced amount of nitrogen, phosphorus, and potash has been used, it has dropped to 0. This would substantiate the South Africans' theory of the nitrogen-phosphorus relationship and at the same time afford evidence of the value of a balance between potassium and phosphorus and nitrogen.

Evidently this soil is in a rather delicately balanced condition and excess feeding of either phosphorus or nitrogen alone can soon bring about poor-keeping quality of fruit.

The Effect of Potash

The exact effect of potassium on keeping quality is not any too clear at the present time. Very briefly, it seems to depend to a certain extent on storage temperature. Thus Wallace has shown that fruit from low-potash areas goes down very quickly in cold store but keeps fairly well in common store, although, of course, shrinkage is bad in this case. On the other hand, fruit from areas high in potash kept much better at lower temperatures. Doubtless there will be found some temperature between the two extremes used by Wallace which will permit of the use of low temperatures for both sorts. He used 1° C. for cold storage and 40-50° F. for common storage.

Before dealing with our final recommendations, I should like to draw your attention to a certain trouble commonly called "stippen" which occurs in various forms and has been classified under different names. For our purpose we can refer to them as cork troubles. Figure No. 1 illustrates this trouble. The trouble has occurred on Fameuse and McIntosh in Eastern Ontario and Quebec. In the case of Fameuse it takes the form of corky core, internal cork, or blotchy cork; all three forms may be found on the same tree. In the case of McIntosh it is nearly always corky core, and we have not yet seen a case of blotchy cork in McIntosh.

We have done a little work with this for the last three years and, while we are at a loss yet as to the exact cause, I think our findings to that date might be of interest.

Fig. No. 2—Leaf showing effects of potash deficiency. Note scorched leaf edge.

In the first place, the trouble is more frequent on shallow soils than on soils of good depth; but it is also found on soil of the latter type. It is also more frequent on poor sandy soils than on clay loam or clay soils, and it is worse in dry years than in seasons of normal rainfall.

These factors, when examined independently of anything else, might lead one to conclude that it was entirely a question of moisture supply in itself, but our observations and work lead us to think it is more nutritional than that. We have, for instance, always found the trouble on very vigorous orchards. We have not as yet located it on definitely low-nitrogen

trees. In one orchard, where the trouble occurs to a considerable extent, there happens to be a fertilizer test which gave results as follows:

Lime only—cork very bad;
Nitrogen only—cork very bad;
Check rows receiving no fertilizer —very little cork, trees showing low vigor;
Potassium only—no cork;
Complete fertilizer—very small amount of cork;
Phosphorus only—no cork.

It should be added that where nitrogen was fed the trees were more vigorous than where it was not fed, but the complete fertilizer rows showed good vigor and a very small amount of cork.

A survey of the orchards in Hemmingford, Que., revealed that the trouble was generally associated with heavy mulching and heavy amounts of nitrogen. Particularly was it noticeable where heavy amounts of hen manure and pig manure mulch were used.

As examples of the influence of fertilizer treatment in contrast to purely water supply, permit me to recite the case of a few isolated trees in two orchards.

In orchard No. 1, the soil is very shallow and in 1933 was almost near the wilting point for the bulk of the summer. The trees were fed fair amounts of nitrogen until two years ago when the owner stopped and relied for a couple of years on mulch only, using old hay and straw. He was free of cork this year except on a few Fameuse trees which were in an old pig yard and a couple that were in his hen yard.

In orchard No. 2, there is fair depth of a good loam. The trees are vigorous and making good growth in a 9-5-7 fertilizer for the last five years.

Cork was found on a few trees of Joyce to which liberal applications of hen manure had been applied for two years.

One McIntosh in this orchard nine years old, which for the last three years had received six pounds of nitrate per tree plus heavy hen manure, showed cork very badly.

One Stark tree ten years old, growing where night soil had been deposited for years, has shown pit every year but in a gradually lowering amount until 1933 when no pit was present. This was the driest year in the history of the country. No fertilizer treatment has been given this tree since planting, and pit is gradually disappearing.

Another isolated tree is of interest. In this case it is an old Canada Red growing in what was, up until nine years ago, a pig yard. The present owner says that when he took away the pig yard of years ago the tree did not produce a single apple without cork. He has not given any fertilizer since and the amount of cork has been getting less until in 1933 it did not exceed 10% of the apples on the tree.

Other Illustrations

An example from our own orchard at Ottawa is noteworthy; a section of our orchard has been treated for the last five years with tremendous amounts of hen-house litter from the Egg-Laying Contest. The remainder of the orchard is under cover crop or sod and ordinary grass mulch. This year we had considerable trouble from the hen-manure section and were practically free of it in the rest of the orchard.

Patten Greenings, growing under the excessive mulch, were 100% pitted this year, whilst the same variety a hundred yards away under complete fertilizer and cultivation was 100% free of the trouble.

In another orchard where we have been working, we have trenched down five feet and found a good root system and good moisture conditions at that depth. An examination of the roots showed heavy iron accumulation and an ash analysis revealed excessively high iron, as high as over 2% iron compared with a fraction of 1% from

(*Turn to page* 29)

Good Quality *in* Canning Peas

By F. L. Musbach

Wisconsin Agricultural Experiment Station, Marshfield, Wisconsin

CANNING peas have always been an important cash crop in Wisconsin. Only one other crop, potatoes, exceeds it in value, though occasionally tobacco occupies second place. Approximately 100,000 acres are devoted to the crop producing in round numbers 50 per cent of the total put up in the United States. In 1933 the acreage was reduced to 88,000 acres yielding approximately 40 per cent of the total United States pack.

The crop is grown in rotation following corn or legume hay, and only in a relatively few areas are peas grown on the same ground more than one year out of three or four. Disease losses are much less severe when the crop is grown under a rotative system insuring better yields and quality.

Mistaken Notions

Until recent years fertilizers, aside from manure, have not been used extensively. Good yields were secured, in the system of cropping followed, without supplementing the barnyard product with commercials. On the older cropped land of the State where the bulk of the peas are grown, fertilizers have been found profitable, though the use of complete fertilizer was discouraged by some canners because of the mistaken notion that the quality of the canned product was impaired if the fertilizer mixture included potash. Then, again, it was argued that since the crop is a member of the legume family it may be depended upon to secure its own nitrogen, and that this element was, therefore, needless. Finally it was believed that fertilizer may hasten maturity unduly, thus making it difficult to harvest the crop at the proper stage for quality product.

Quality Is Important

The importance of quality in canned products has been a subject meriting much discussion at every meeting of the National Canners' Association in recent years. The housewife is demanding quality in canned goods, and the canner aims to satisfy the demand. Then, too, doesn't her grocer point out the hamper of "fresh" garden peas just in this morning from beyond the Rio Grande or elsewhere? These far-away shipments, it must be remembered, come to the Northern markets when our canned products should be moving off from the merchant's shelf.

The question of the effect of complete fertilizers, or any particular constituent in fertilizers, on the quality of peas until recent years has remained one about which much has been said but little done. The purpose of the work here reported was to study the quality of canned peas as influenced by fertilizers. Some chemical studies also were undertaken.

On a uniform piece of Miami silt loam various combinations of fertilizers were applied at the rate of 300 pounds per acre, and the field was

(*Turn to page* 28)

The Inquiring Mind *and the* Seeing Eye

By Dr. A. S. Alexander

University of Wisconsin

FOR 41 years Dr. Frank Thomas Shutt has borne the imposing title of Dominion Chemist and filled the position of trust and responsibility it designates, in unique and completely satisfactory manner. Unique, because it was formulated and founded by him; satisfactory, because he has exceeded the most sanguine expectations of his employers in the masterly way in which he has conducted its multifarious functions and duties for the benefit of farmers, the honor of the science of chemistry, and the credit of his country.

Studying the records of Dr. Shutt's life work, one is amazed at the dynamic energy he has brought to the accomplishment of his onerous but congenial task. One wonders whence such energy comes, and how it has been maintained. Apparently he has never wasted a moment of time, and his holidays, if any, have been few and far between. Indeed, his trips away from Ottawa have been taken chiefly, for purposes of study rather than for pleasure, and ever he has had upmost in mind the furtherance of his efficiency for research in the chemistry of agriculture.

Despite the long hours and tedium of his labors in laboratory and library, he has managed to take walks abroad for the study and admiration of the works of the Creator, and well has proved the truth of Wordsworth's assertion that "Nature never did betray the heart that loves her." His walks, where solitude is sweet, appeal to him more than golf. Dogs of all breeds are his friends and companions. His pipe is a source of solace.

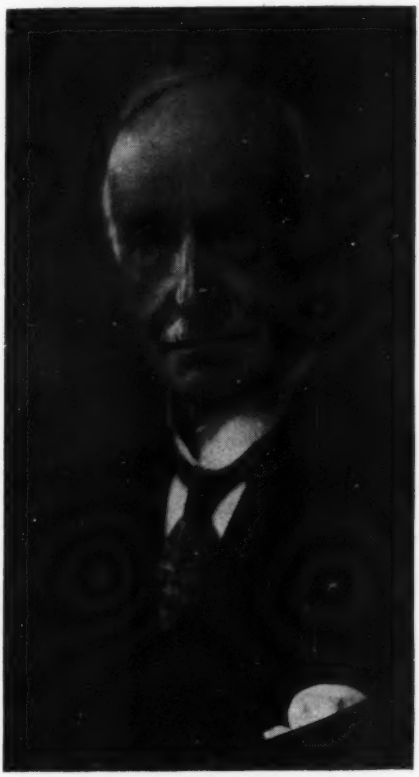
Then, too, his love of Nature has found expression in music, for he is an accomplished musician, and in the many camera pictures he has made and exhibited with success, as an amateur photographer possessed of professional skill. A gallery of over 200 pictures graces the walls of his beautiful home on the banks of Rideau River where also a vast library is housed.

Most Versatile

Seldom does one find a scientist so versatile as he and so thorough and exact in all that he undertakes. Withal, he is of charming personality and is a pleasing and prolific writer of articles, reports, bulletins, and official and scientific documents of surpassing clarity and pureness of diction. He has contributed nearly 40 articles to the Transactions of the Royal Society of Canada, and has prepared many important papers for home and foreign journals. Publications on chemical research regarding a wonderfully wide range of subjects have come annually from his facile pen. Their number is legion, and all of them have been characterized by authenticity, conciseness, and educational value. The extent of his writing, and that of his able staff, may be judged by the

fact that annually some 35,000 letters are mailed from the Central Experimental Farm at Ottawa, in addition to reports, bulletins, and other printed matter. For more than a quarter of a century Dr. Shutt also conducted a column in "The Family Herald and Weekly Star" in which he gave practical and scientific information on all matters pertaining to "Chemistry on the Farm."

But ability as a writer has not been



Dr. Frank Thomas Shutt

his sole means of conveying to the public the results of his experiments and investigations in a useful and informative manner, for he has been a ready and convincing speaker. Being a practical farmer, he also has been as much at home with rural audiences as with congregations of chemists and research men in other branches of science. At all of these meetings he has not only upheld the dignity of the savant, but has been able patiently and clearly to explain matters in doubt or dispute and, possessing a nimble wit and readiness in repartee, ably has acquitted himself in public debates. Always, he has shown the attributes of the gentleman, and so is regarded as a true friend by hosts of admirers.

Dr. Shutt holds that the object of science is to discover facts and then correlate and coordinate them, so that laws and principles may be established. He has found that *chemistry tells the tale of soil impoverishment,* and for more than 40 years has been striving, through his knowledge of that science, to offset the depletion of soil fertility and devise means for the productive improvement of Canadian farms. His work has borne fruit, as evidenced by improved conditions on every hand; but he does not attribute that solely to the research work of himself and his colleagues in the field of agricultural chemistry. He is of the opinion that the marked improvement in farming as an industry, in recent years, has been due largely to the abandonment of haphazard rule-of-thumb methods, as well as the adoption of methods based on the results of carefully and skillfully conducted investigations by chemists, botanists, physiologists, physicists, entomologists, and other scientists. He respects and appreciates the work of his brother scientists in all branches of the art having a bearing on agriculture.

"Rational, profitable farming today," according to Dr. Shutt, "has scientific truths for its foundation." He acknowledges also that the work of himself and his staff in chemistry has been assisted very greatly by help rendered in various ways by those in charge of the chemical investigations at the agricultural experiment stations of the United States.

Despite all that has been accomplished during his long and purposeful tenure of the position of Dominion Chemist, and all that has been done by others in like posts elsewhere, he modestly confesses that so much re-

mains to be undertaken that he feels at times as if a beginning had not yet been made. Nevertheless, in looking back, he does not find it difficult to see where chemical research has played its part in the development of Canadian agriculture.

An Important Trio

He believes that the three sciences —chemistry, physics, and biology— must all contribute their share of work toward complete and correct soil diagnosis, and as his contribution, he has been trying to construct a plan or system of farming that will materially lessen the deterioration consequent to exclusive grain farming. As among the factors that conduce to profitable farming a productive soil is perhaps the one of greatest importance, it is natural that from the outset he has made the matter of economic maintenance and increase of soil fertility his special study. The requirements of crops and animals, the constitution and needs of soils, the most economical means of maintaining soil fertility, the nature and amounts of fertilizing ingredients in manure, the relative value of forage crops and cattle feeds, the composition of dairy products, the constituents and preparation of fungicides and insecticides—all these and many more have been the subjects of Dr. Shutt's chemical research and analysis. He considers the relationship that exists between modern and progressive agriculture and chemistry so important and intimate that, truthfully, it may be asserted that up-to-date farming is putting into practice the teaching of himself and other leading agricultural chemists.

The variety of materials analyzed in Dr. Shutt's laboratories since 1890, in addition to ordinary farm soils, feeds, fertilizers, and insecticides, is astonishing. The list includes hundreds of analyses of marsh, river and mussell muds, mucks, leaf molds, bracken, peats, mosses, seaweed, eelgrass, spent sewage, cotton-factory waste, flue ashes, dog-fish scrap, tobacco refuse, whale scrap, grape refuse, elevator dust, boiler scale, spent bone and, many other unusual commodities. His analyses of drinking water have materially ministered to the health of the farming communities of Canada.

Frank Thomas Shutt was born in Stoke Newington, London, England, September 15, 1859, the son of William Denis Shutt, C. E., and Charlotte Cawhorn Shutt, a native of Leeds, Yorkshire. Expert as a civil engineer, his father supervised the work of the Thames River Embankment and the Abbey Mills Pumping Station of the London sewage system. Young Frank, being somewhat delicate, was educated at home by tutors instead of attending the public schools.

After arriving in Canada, he was a pupil of Dr. William Hodgson Ellis, Principal of the School of Technology, Toronto. Subsequently he became private assistant in analytical work and teaching to Dr. Ellis. On removal of the college to the School of Practical Science, Queen's Park, affiliated with the University of Toronto, Dr. Ellis became Professor of Applied Chemistry and acted as Public Analyst. As his assistant, young Shutt served for five years and obtained valuable experience in the analyzing of foods, and in teaching and lecturing work.

Accorded Many Honors

In 1883 he matriculated at Toronto University with first class honors in the science course, and in 1885, graduated B.A. with first class honors and medal in chemistry and biology. In 1886 he received the degree of M.A., and in 1894, that of Doctor of Science. In 1928 he was awarded the sum of $1,250 by the American Society of Agronomy in recognition of his research work on the nitrogen problems of North American agriculture. On graduation in 1885, he was appointed Fellow in Chemistry and held that appointment until selected as

(*Turn to page* 25)

Pictorial

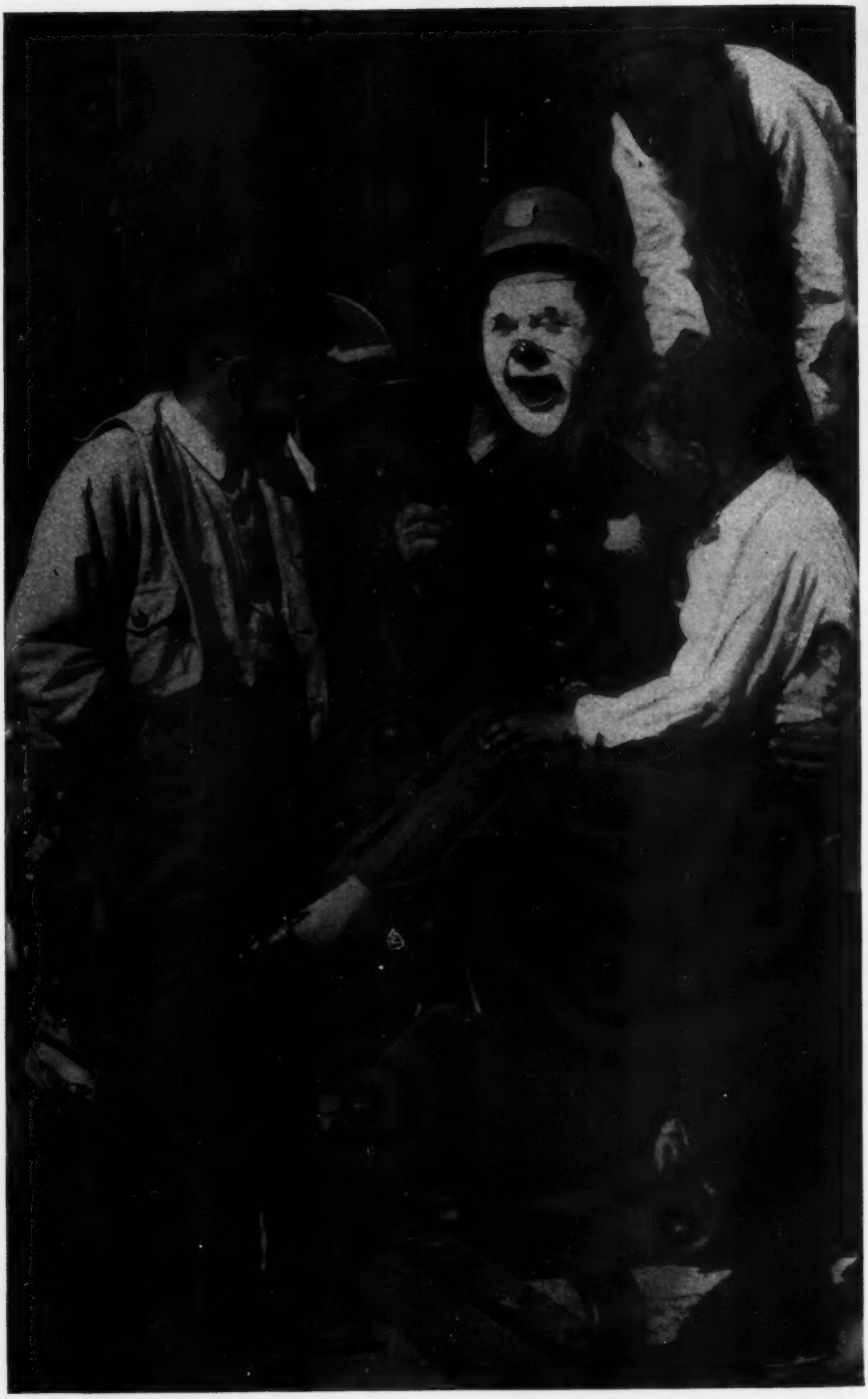
ENJOYING A SPRING TWILIGHT, AFTER THE DAY'S WORK IS DONE.

Above: In Kentucky, home of the famous bluegrass pastures.

Left: Some future potato pickers of Florida.

Right: The contentment of this little piggy is evident.

Below: Where there's a will, there's a way.



THE THRILL OF A LIFETIME.

The Editors Talk

Tung Oil

A relatively new interest in American agriculture is the production of tung oil. There is a growing need for reliable information on the best fertilizers to use in the production of tung trees. According to a report by the U. S. Department of Commerce, entitled "Tung Oil," this oil has become "particularly well-known as an essential raw material in the manufacture of varnishes, also for the water-proofing of wood and many other substances." It is also pointed out that domestic requirements are at present derived almost exclusively from China, and the imports for the years 1926-1930 have expanded steadily from 83,000,-000 pounds in 1926 to over 126,000,000 pounds in 1930.

The tung oil of commerce is expressed from the seeds of two species of Aleurites, belonging to the spurge family, which differ considerably in appearance and characteristics. It has been found that tung trees can be grown satisfactorily in the Gulf States. Work on the fertilization of tung trees is in progress. In Mississippi fertilizer experiments are under way. Florida also has made recommendations with reference to the nutrient requirements of tung trees. One of the difficulties to be overcome apparently is that the trees are apt to grow too quickly and have not a sufficiently close grain for strong, firm trees. Under certain conditions of growth, die-back is also prevalent.

From the point of view of the chemical content of the dry matter in the fruit, shells and almonds, interesting data is provided in the following table:

(l'Agronomie Coloniale, Octobre 1933) P. Ammann
"Huile d'Aleurites Fordii de Madagascar"
(Tung Oil of Madagascar)
p. % Dry Matter:

	Envelope of fruits	Shells	Almonds
Ashes	4.25	7.14	2.92
P_2O_5	.247	.227	.973
CaO	.55	.586	.437
MgO	.249	.182	.02
K_2O	2.937	1.276	.683
N	.93	.927	3.051
Moisture when analyzed	11.97	14.60	4.71

Apparently there are few places in the world where adequate nutritional experiments have been conducted. In view of the growing need for tung oil in America, and the fact that trees can be grown in this country, there would seem to be a particular field for the contribution of agricultural workers to our knowledge of the nutritional requirements of tung trees for the production of maximum quantities of tung oil from trees free of disease.

Reforesting the South

In connection with the work of the National Forest Reservation Commission and the program for which President Roosevelt last June allotted $20,000,000 of Emergency Conservation Work funds, it is very interesting to note some of the outstanding advantages of Southern States as a field for forestry development. E. L. Demmon, Director of the Southern Forest Experiment Station at New Orleans, believes that with approximately 200,000,000 acres either in forest or cut-over land, the volume of annual wood production possible under adequate forest protection and management will be a most important factor in the economic and social progress of the South.

Among the South's advantages in forestry, Mr. Demmon lists its great number of valuable fast-growing native timber species, its long growing season, its abundant rainfall, the comparatively easy conditions for logging, the relative ease and low cost at which forest crops can be produced, and proximity to great timber markets.

"The South has long been an outstanding source of lumber and other forest products," he says. "One reason for this is that it leads all other sections of the United States in area of commercial forest land, with 39 per cent of the total for the country. Within its borders, 73 per cent of all land is either in forest or has been cut over and now lies idle; 64 per cent of its gross area is commercial forest land. Although the South has only 12 per cent of the volume of merchantable saw-timber of the Nation, it exceeds in this respect all other regions except the Pacific Coast. As an industry, the forests of the South rank second only to agriculture in importance. Forest products cut and sold on farms rank fourth among all farm crops in the South, with a total annual income to farmers of more than 82 millions of dollars, being exceeded only by cotton, tobacco, and potatoes."

Rothamsted's Appeal

Everyone who has visited the Rothamsted Experimental Station at Harpenden, England, and everyone who has studied its valued records to agriculture will be interested in knowing that an appeal for donations to purchase the holdings has been launched. The Journal of the Ministry of Agriculture for April, 1934, contains some notes on this subject. It says: "The menace of encroaching building development has made it necessary for the Committee of the Rothamsted Experimental Station to launch a public appeal for a fund of 30,000 pounds to purchase their holdings."

Before the death of John Bennet Lawes, he established a Trust to continue the work begun by himself in association with Joseph Henry Gilbert. He gave to the Trust for a term of years the use of the land on which the field experiments had been carried out. But, "the old leases and agreements," the Journal reports, "no longer afford a prospect of the peaceful continuity essential for agricultural experiments. It has become necessary to purchase, and the Trustees of the Lawes Estate have agreed to sell the necessary land to the Rothamsted Committee for the sum stated."

In view of the great value of the long-continued experiments to world agriculture, it is hoped that this public appeal will be successful and that the classic work started long years ago by Lawes and Gilbert will be continued.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Fertilizers, Soils, Crops, and Economics. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

An interesting and highly significant compilation of fertilizer and plant-food consumption data has been prepared by the Department of Agronomy of the Ohio State University under the title of "Spring and Fall Fertilizer Sales in Ohio in 1933." Actual tonnage of fertilizer materials and of the various mixed fertilizer analyses for a number of years are given. The highest total fertilizer sales were made in 1929 and the lowest in recent years in 1932. A 23 per cent increase in sales in 1933 was a pleasing indication of an improvement in the agricultural situation, but sales were still very low. Plant-food consumption data from 1924 to date show significant changes in fertilizer usage in Ohio during this period. Nitrogen and potash consumption have increased, the former more than the latter, while phosphoric acid has decreased.

Similar data for 1932 and 1933 in Massachusetts are contained in Control Series Bulletin No. 69 of the Massachusetts Agricultural Experiment Station, "Inspection of Commercial Fertilizers," by H. D. Haskins. The effects of the poor agricultural situation are shown in the falling off in total tons of fertilizer sold and in a lower consumption of all plant foods in these years.

Bulletins of this type, giving such complete records of fertilizer sales and of plant-food consumption, are highly commendable. The number of States compiling such data is increasing and those interested in fertilizer usage hope that all States soon will be publishing complete records of plant-food consumption. Such data are essential for the intelligent interpretation of trends in fertilizer usage and aid in gauging the efficiency of fertilizer practice.

"Quarterly Bulletin," State Board of Agr., Dover, Del., Vol. 23, No. 4, Fertilizer Report-Seed Report, July-December, 1933, *Feeds and Miscellaneous, January-December,* 1933, *for Quarter Ending Dec.* 31, 1933, *H. H. Hanson.*

"Annual Report of the State Chemist of Florida for the Year Ending December 31, 1933," *Dept. of Agr., Tallahassee, Fla., Quar. Bul. Vol.* 43, *No.* 1, *Jan.* 1, 1934, *J. J. Taylor.*

"Commercial Fertilizers, 1933," *Agr. Exp. Sta., Orono, Me., Official Inspections* 149, *James M. Bartlett.*

"Commercial Fertilizers, Commercial Feeds and Agricultural Liming Materials." Univ. of Md., College Park, Md., Control Series, No. 150, *Jan.,* 1934.

"Inspection of Agricultural Lime Products," Agr. Exp. Sta., Amherst, Mass., Control Series, Bul. 71, *Dec.,* 1933, *H. D. Haskins.*

"Fertilizer Tests on an Important Pasture Soil Type," Agr. Exp. Sta., Amherst, Mass., Bul. 306, *Jan.,* 1934, *A. B. Beaumont.*

"Buying Fertilizers," Agr. Exp. Sta., East Lansing, Mich., Ext. Bul. 47, *(Rev.) May,* 1933, *E. C. Sackrider.*

"Investigations in the Use of Nitrate of Soda for Field Crops," Agr. Exp. Sta., Columbia, Mo., Bul. 327, *July,* 1933, *M. F. Miller and R. L. Lovvorn.*

"Fertilizer Experiments on Strawberries with a Presentation of Statistical Methods for Calculating the Significance of Plot Yields," Agr. Exp. Sta., Durham, N. H., Tech. Bul. 55, *June,* 1933, *L. P. Latimer and S. W. Wentworth.*

"Fertilizer and Tillage for Blueberries," Agr. Exp. Sta., New Brunswick, N. J., Bul. 558, *Nov.,* 1933, *Charles S. Beckwith and Charles A. Doehlert.*

"Fourth Annual Fertilizer Report of New

Mexico Feed & Fertilizer Control Office, State College, New Mexico, March 1, 1934," F. E. Oakes.

"A Test of Floats as Fertilizer and a Study of the Influence of Farm Manure on Their Effectiveness," Agr. Exp. Sta., Ithaca, N. Y., Bul. 574, June, 1933, T. L. Lyon.

"Manganese an Essential Element for Green Plants," Agr. Exp. Sta., Ithaca, N. Y., Mem. 151, Jan., 1934, Edwin Fraser Hopkins.

"Report of Analyses of Commercial Fertilizers Sold in New York State July 1, 1932 to June 30, 1933," Dept. of Agr. and Mkts., Albany, N. Y., Agr. Bul. 280, Nov., 1933, Charles H. Baldwin.

"Fertilizer Analyses for Different North Carolina Crops Including the Best Percentages of Water-Insoluble Nitrogen of Totals in Fertilizer Mixtures Recommended," Agr. Exp. Sta., State College Station, Raleigh, N. C., Agron. Infor. Cir. 85, Jan., 1934, R. Y. Winters.

"Inspection of Fertilizers," Agr. Exp. Sta., Kingston, R. I., Ann. Fert. Cir., Sep., 1933, W. L. Adams and A. S. Knowles, Jr.

"Farm Manures," Agr. Exp. Sta., Clemson College, S. C., Ext. Bul. 92, Sep., 1932, R. W. Hamilton.

Soils

In line with increasing the efficiency of agriculture, more and more attention has been paid in recent years to land utilization. This is reflected in numerous publications of Agricultural Experiment Stations dealing with various phases of land utilization, especially as affecting the production of farm crops. "Crop Response to Lime and Fertilizer on Muck Soil" by C. B. Williams, H. B. Mann, and J. L. Rea, Jr., of the North Carolina Agricultural Experiment Station (Bulletin 292) shows how the disappointing crop yields on cut-over swamp land in that State were due mainly to improper fertilization. From the results of work on these soils it would appear as if the key to improved yields is the use of lime and complete fertilizer.

A classification of the soils of Maryland on the basis of their adaptability to produce certain crops has been prepared by O. C. Bruce and J. E. Metzger in Maryland Agricultural Experiment Station Bulletin 351, "The Soils of Maryland." This should serve as a useful guide in determining the best crops to grow on the various soils of the State and thus aid in the better utilization of these soils.

P. T. Gish and T. B. Hutcheson have made an intensive study of an important soil type in Virginia. They experimented on lime and fertilizer treatments and types of crops and varieties that are likely to give best results. This work will be of great value to farmers on this and similar types of soil. The methods used, data, and conclusions reached are contained in Virginia Agricultural Experiment Station Bulletin 292, "Field Crops on Berks Shale Soil Respond to Lime and Fertilizers."

The Illinois Agricultural Experiment Station has maintained 26 permanent experimental fields in various parts of the State covering the most important agricultural soils on which types of farming and soil fertilization are studied. Crop yields and the interpretation of the results for 1932 are given by F. C. Bauer in Illinois Agricultural Experiment Station Bulletin 398 entitled, "Crop Yields from Illinois Soil Experiment Fields in 1932." These experiments bring out very forcefully the variation in soil types and the necessity of adapting the type of farming and, more particularly, the fertilization of the crop to the soil. It is emphasized also that the longer the soils are intensively farmed, the greater is the attention that must be paid to proper fertilization, if farmers "are to make the most economic use of their land."

"The Relation of Certain Soil Characteristics to Forest Growth and Composition in the Northern Hardwood Forest of Northern Michigan," Agr. Exp. Sta., East Lansing, Mich., Tech. Bul. 135, Sep., 1933, R. H. Westveld.

"The Occurrence of Azotobacter in Peat Soils in New York," Agr. Exp. Sta., Ithaca, N. Y., Mem. 148, June, 1933, J. K. Wilson and B. D. Wilson.

"The Character of the Peat Deposits of New York," Agr. Exp. Sta., Ithaca, N. Y., Mem. 149, June, 1933, B. D. Wilson and E. V. Staker.

"Lysimeter Investigations—III. Mineral and Water Relations and Final Nitrogen Balance in Legume and Non-legume Crop Rotations for a Period of 16 Years," Agr. Exp. Sta.,

Geneva, N. Y., Tech. Bul. 212, Aug., 1933, R. C. Collison, H. G. Beattie, and J. D. Harlan.

"Moisture and Fertility Relations of Subsoil Variations in Heavy Silt Loam Soil at Goodwell, Oklahoma," Agr. Exp. Sta., Stillwater, Okla., Bul. 214, Nov., 1933, H. H. Finnell.

"The Economy of Soil Nitrogen under Semiarid Conditions," Agr. Exp. Sta., Stillwater, Okla., Bul. 215, Dec., 1933, H. H. Finnell.

"Raw Organic Matter Accumulations Under Various Systems of Culture," Agr. Exp. Sta., Stillwater, Okla., Bul. 216, Dec., 1933, H. H. Finnell.

"The Results of Twenty Years Complete Soil Fertility Tests, Brookings, S. D.," Agr. Exp. Sta., Brookings, S. D., Bul. 280, Apr., 1933, Joseph Gladden Hutton.

"Soil Profile and Root Penetration as Indicators of Apple Production in the Lake Shore District of Western New York," U. S. D. A., Washington, D. C., Cir. 303, Dec., 1933, A. T. Sweet.

"A Study of Claypan Soils," U. S. D. A., Washington, D. C., Tech. Bul. 399, Dec., 1933, Irvin C. Brown, T. D. Rice, and Horace G. Byers.

"Soil Survey of Coosa County, Alabama," U. S. D. A., Washington, D. C., Series 1929, No. 18, Arthur E. Taylor and J. F. Stroud.

"Soil Survey of the Yuma-Wellton Area, Arizona-California," U. S. D. A., Washington, D. C., Series 1929, No. 20, F. O. Youngs, W. G. Harper, James Thorp, and M. R. Isaacson.

"Soil Survey of The Capistrano Area, California," U. S. D. A., Washington, D. C.., Series 1929, 19, E. J. Carpenter and R. Earl Storie.

"Soil Survey of The Paso Robles Area, California," U. S. D. A., Washington, D. C., Series 1928, No. 34, E. J. Carpenter and R. Earl Storie.

"Soil Survey of Blackford County, Indiana —Part 1, The Management of Blackford County Soils—Part 2," U. S. D. A., Washington, Series 1928, No. 32, D. C., W. E. Tharp, S. R. Bacon, A. T. Wiancko, and S. D. Conner.

"Soil Survey of Colfax County, Nebraska," U. S. D. A., Washington, D. C., Series 1930, No. 11, A. W. Goke, W. J. Moran, F. A. Hayes, E. A. Nieschmidt.

Crops

The spring season has brought forth an interesting lot of practical information on the profitable production of various crops. In addition are several annual reports from experiment stations summarizing work done in the interests of the farmers. A great many of these publications will prove valuable additions to farm-home, county-agent, and school libraries.

"Irish Potato Culture in the Coastal Plain of Georgia," Ga. Coastal Plain Exp. Sta., Tifton, Ga., Bul. 20, Jan., 1933, Otis Woodard.

"A Year's Progress in Solving Farm Problems of Illinois," Agr. Exp. Sta., Urbana, Ill., 46th Ann. Rept. for Year Ended June 30, 1933. H. W. Mumford.

"Report on Agricultural Research for the Year Ending June 30, 1933," Agr. Exp. Sta., Ames, Iowa, R. M. Hughes.

"Growing Tomatoes in Kansas," Agr. Exp. Sta., Manhattan, Kan., Cir. 172, Nov., 1933, Walter B. Balch.

"Sorghum Production in Kansas," Agr. Exp. Sta., Manhattan, Kan., Bul. 265, July, 1933, H. H. Laude and A. F. Swanson.

"Forty-Fourth Annual Report of the Agricultural Experiment Station of the University of Kentucky for the Year 1931—Part II," Agr. Exp. Sta., Lexington, Ky., Buls. 314-325.

"Bean Investigations," Agr. Exp. Sta., Baton Rouge, La., Bul. 245, Dec., 1933, Julian C. Miller and W. D. Kimbrough.

"A Study of the Factors Influencing Red Color on Apples," Agr. Exp. Sta., College Park, Md., Bul. 353, July, 1933, L. A. Fletcher.

"Culture and Use of Popcorn," Agr. Exp. Sta., East Lansing, Mich., Cir. Bul. 148, Jan., 1934, J. R. Duncan.

"The Quarterly Bulletin," Agr. Exp. Sta., East Lansing, Mich., Vol. 16, No. 3, Feb., 1934.

"Work of the Agricultural Experiment Station—The Report of the Director for the Year Ending June 30, 1932," Agr. Exp. Sta., Columbia, Mo., Bul. 328, July, 1933, F. B. Mumford and S. B. Shirky.

"The Best Practices in Oats Production," Agr. Exp. Sta., Columbia, Mo., Cir. 171, Jan., 1934, C. A. Helm.

"The Nature of Shedding of Immature Apples," Agr. Exp. Sta., Columbia, Mo., Res. Bul. 201, Aug., 1933, A. E. Murneek.

"Lespedeza Serica," Agr. Exp. Sta., Columbia, Mo., Bul. 331, Dec., 1933, C. A. Helm and W. C. Etheridge.

"Forty-Sixth Annual Report 1933," Agr. Exp. Sta., Cornell Univ., Ithaca, N. Y., Carl E. Ladd.

"Fifty-Second Annual Report for the Fiscal Year Ended June 30, 1933," Agr. Exp. Sta., Geneva, N. Y., U. P. Hedrick.

"Orchard Management," Agr. Exp. Sta., Geneva, N. Y., Cir. 121 (Rev.), Jan. 1, 1934.

"Studies in Plant Propagation—The Influence of Chemicals, of the Medium, and of the Position of the Basal Cut, on the Rooting of Evergreen and Deciduous Cuttings," Agr. Exp. Sta., Ithaca, N. Y., Bul. 571, June, 1933, L. C. Chadwick.

"Nut Growing in New York State," Agr. Exp. Sta., Ithaca, N. Y., Bul. 573, June, 1933, L. H. MacDaniels.

"The Rate of Photosynthesis of Apple Leaves Under Natural Conditions. Part I,"

Agr. Exp. Sta., Ithaca, N. Y., Bul. 577, Nov., 1933, A. J. Heinicke and M. B. Hoffman.

"Varieties of Alfalfa in Pennsylvania," Agr. Exp. Sta., State College, Pa., Bul. 295, Sep., 1933, H. B. Musser and C. J. Irvin.

"Influence of the Cion and of an Intermediate Stem-Piece upon the Character and Development of Roots of Young Apple Trees," Agr. Exp. Sta., Geneva, N. Y., Tech. Bul. 218, Nov., 1933, H. B. Tukey and Karl D. Brase.

"Planning the Home Garden in Eastern North Carolina," Agr. Exp. Sta., State College Station, Raleigh, N. C., Ext. Cir. 198, Mar., 1934, E. B. Morrow.

"Current Investigations of the North Carolina Agricultural Experiment Station 1933-34," Agr. Exp. Sta., State College Station, Raleigh, N. C., Bul. 294, Feb., 1934, R. Y. Winters.

"Relation of the Quality of Cotton Planting Seed to Length of Staple," Agr. Exp. Sta., State College Station, Raleigh, N. C., Bul. 296, Feb., 1934, J. H. Moore.

"Annual Report of the Director for the Fiscal Year Ending June 30, 1932," Agr. Exp. Sta., Brookings, S. D., James W. Wilson.

"Growing Sweet Corn in Texas," Agr. Exp. Sta., College Station, Tex., Cir. 69, Feb., 1934, P. C. Mangelsdorf.

"The Home Garden and Orchard in the Wichita Valley," Agr. Exp. Sta., College Station, Tex., Cir. 70, Jan., 1934, L. E. Brooks and C. H. McDowell.

"Rate of Water Evaporation in Texas," Agr. Exp. Sta., College Station, Tex., Bul. 484, Nov., 1933, R. E. Karper.

"Growing Cherries East of the Rocky Mountains," U. S. D. A., Washington, D. C., Farmers' Bul. 776 (Rev.) June, 1933, H. P. Gould.

"Strawberry Culture—Eastern United States," U. S. D. A., Washington, D. C., Farmers' Bul. 1028 (Rev.) July, 1933, George M. Darrow.

"Corn Culture," U. S. D. A., Washington, D. C., Farmers' Bul. 1714, Nov., 1933, Frederick D. Richey.

"List of Bulletins of the Agricultural Experiment Stations for the Calendar Years 1931 and 1932," U. S. D. A., Washington, D. C., Misc. Pub. 181, Mar., 1934, Catherine E. Pennington.

"Forty-Third Annual Report for the Fiscal Year Ended June 30, 1933," Agr. Exp. Sta., Pullman, Wash., Bul. 291, Jan., 1934, Edw. C. Johnson.

"Forty-Third Annual Report of the University of Wyoming Agricultural Experiment Station, 1932-1933," Agr. Exp. Sta., Laramie, Wyo., J. A. Hill.

Economics

If the depression has done nothing else for the welfare of the country, it has put a premium upon good management. There will be found among the publications listed below several studies on farm management, from which can be gleaned much information on practices which will go a long way toward beating hard times.

"Types of Farming in the Eastern Connecticut Highland," Agr. Exp. Sta., Storrs, Conn., Bul. 191, Aug., 1933, I. G. Davis.

"Profitable Systems of Farming for the Idaho Falls Area," Agr. Exp. Sta., Moscow, Idaho, Bul. 198, June, 1933, Paul A. Eke and Neil W. Johnson.

"Agricultural Outlook for Illinois 1934," Agr. Exp. Sta., Urbana, Ill., Cir. 417, Jan. 31, 1934, H. W. Mumford.

"Corporate-Owned Land in Iowa," Agr. Exp. Sta., Ames, Iowa, Bul. 307, Sep., 1933, William G. Murray and Ronald C. Bentley.

"Prospects for Agricultural Recovery—I. The Economic Situation in 1933," Agr. Exp. Sta., Ames, Iowa, Bul. 310, Dec., 1933, Geoffrey Shepherd.

"Prospects for Agricultural Recovery—III. Estimating Advantages of the Corn-Hog Plan to the Individual Farm," Agr. Exp. Sta., Ames, Iowa, Bul. 312, Jan., 1934, John A. Hopkins, Jr.

"Prospects for Agricultural Recovery—IV. National Economic Planning," Agr. Exp. Sta., Ames, Iowa, Bul. 313, Jan., 1934, Geoffrey Shepherd.

"A Farm Management Study of 70 Dairy Farms in Montgomery County, Maryland," Agr. Exp. Sta., College Park, Md., Bul. 356, Sep., 1933, Donald E. Watkins.

"A Farm Management Study of Crop Production Practices," Agr. Exp. Sta., East Lansing, Mich., Spec. Bul. 241, Sep., 1933, P. G. Minneman and E. B. Hill.

"Grape Production Costs and Returns in Southwestern Michigan," Agr. Exp. Sta., East Lansing, Mich., Spec. Bul. 242, Sep., 1933, N. L. Partridge.

"Local Prices of Farm Products in Nebraska, 1895-1932," Agr. Exp. Sta., Lincoln, Neb., Bul. 284, July, 1933, H. C. Filley and Arthur M. Hauke.

"Economic Studies of Dairy Farming in New York—XI. Success in Management of Dairy Farms as Affected by the Proportion of the Factors of Production," Agr. Exp. Sta., Ithaca, N. Y., Bul. 562, June, 1933, P. H. Stephens.

"Costs and Returns in Producing Apples in the Newfane-Olcott Area, Niagara County, New York, 1926 to 1928," Agr. Exp. Sta., Ithaca, N. Y., Bul. 565, June, 1933, T. E. LaMont.

"Costs and Returns in Producing Potatoes in New York in 1929," Agr. Exp. Sta., Ithaca, N. Y., Bul. 568, June, 1933, F. L. Underwood.

"Wisconsin Farm Prices 1841 to 1933," Agr. Exp. Sta., Madison, Wis., Res. Bul. 119, Nov., 1933, W. P. Mortenson, H. H. Erdman, and J. H. Draxler.

The Inquiring Mind

(*From page* 14)

Chemist to the Dominion Government Experimental Farms System, in 1887, with headquarters at Ottawa. The act establishing the Experimental Farms System was passed by the Federal Parliament in 1886.

Dr. Shutt is a member of the Royal Chemical Society of England, and of the American Association for the Advancement of Science, and a Fellow of the Royal Society of Canada, the Canadian Institute of Chemistry, the London, England, Chemical Society, and the Institute of Chemists of Great Britain. In 1931 he took part in the ceremonies commemorating the Jubilee of the Pennsylvania State Agricultural Experiment Station. We understand, too, that he has been asked to accept the Presidency of the Agricultural Section of the British Association for the Advancement of Science at the 1934 convention to be held in Aberdeen, Scotland. He is an Episcopalian and 20 years ago served as organist in St. Matthew's Church, Ottawa.

A Practical Farmer

As already has been stated, Dr. Shutt is a practical farmer. He owns a farm of about 160 acres called "The Maples" at Kemptville, Ontario, 35 miles west of Ottawa, and fronting on the Rideau River. It was purchased 10 years ago. There he maintains a fine herd of Holstein cows whose milk goes to a local butter factory, while the skimmilk is fed to a large number of pigs which have returned a profit. The farm is well managed by his nephew, Archie Homes, and is a source of recreation as well as practice and profit to Dr. Shutt. There, despite the extreme frigidity of the Canadian winter, this hardy old bachelor sometimes may be seen enjoying the strenuous work of cutting and hauling wood from the "bush."

He has, throughout life, been lovingly devoted to his mother, who lived with him and was alert in mind and body until a month before her decease in 1920, at the great age of 93 years. A beautiful home was built by him on the banks of the Ottawa River in the fine suburb of Rockcliffe, in addition to his house at Warrington Drive on the Rideau River.

When Dr. Shutt assumed the position of Dominion Chemist in 1887 at the Central Experimental Farm, there was but one small room equipped as a laboratory. Since then the division of Chemistry, under his direction, has grown in a wonderful way. The Chemistry Building erected there in 1896, and since then twice enlarged, contains 14 well-equipped laboratories, with a technical staff of 12 to 15 experts. In connection with the Central Experimental Farm at Ottawa, which is headquarters of the chief administrative officers and scientific staff, there are fully equipped laboratories for the chemical, botanical, entomological, and other departments, with a force of trained men necessary to cope with the many problems requiring scientific investigation.

Many Branch Stations

The Central Experimental Farm on the confines of the City of Ottawa comprises 465 acres, including an arboretum and botanical garden of about 60 acres. Many branch experiment stations also have been established. The four original ones were located at Nappan, Nova Scotia; Brandon, Manitoba; Indian Head, Saskatchewan; and Agassiz, British Columbia. From 1906 to 1912, branch stations were established at Lethbridge, for South Alberta; Lacombe, for Alberta; Rosthern, for Central Saskatchewan; Scott, for Northern Saskatchewan; Charlottetown, for Prince Edward Island; Cap

Rouge, near Quebec, for the Province of Quebec; and another at Ste. Anne de la Pocatière, for Eastern Quebec. In 1912 four more stations were established: Two in the east, one at Kentville, Nova Scotia, and the other at Fredericton, New Brunswick; and two in the west, one at Sidney, on Vancouver Island, and the other at Invermore, on the Columbia River, British Columbia.

In addition to work being conducted at the stations mentioned, there was, up to 1913, experimental work being carried on at Fort Vermilion, on Peace River; at Kamloops and Salmon Arm, British Columbia; and at Forts Smith, Resolution, and Providence, in the far north. Other stations have since been established in different sections of the Dominion.

A Wide Scope

The scope of the research work in the various branches of agriculture still facing all departments of the Central Farm Institution, for the benefit of the farmers of new districts, may be imagined when it is remembered that the three western provinces of Canada are estimated to contain 180,000,000 acres of land suitable for cultivation, chiefly wheat growing, of which, in 1910, but six per cent was under cultivation. Furthermore, there is in the territory north of Alberta and Saskatchewan, within the boundaries of Mackenzie, Keewatin, and Yukon, an area of more than 900,000,000 acres, in several districts of which wheat has been successfully grown.

B. Leslie Smith, C.D.A., F.C.S., the eminent soil fertilizer specialist, of Montreal, writing in "The Farmer's Advocate," stated that Dr. Shutt visited Rothamsted, "mother of experiment stations," England, in 1888, and other agricultural experiment stations, including that of Bernburg, Germany, where Hellriegel and Wilfarth discovered that legumes possess the power of fixing and using atmospheric nitrogen. At Rothamsted he became acquainted with Sir John Bennet Lawes and Sir Joseph Henry Gilbert, who worked there for 57 years and made a record of monumental deeds rather than years. He is also a friend of Sir Daniel Hall and Sir John Russell, successors of Lawes and Gilbert, who gave addresses at the World's Grain Conference at Regina, Canada, in July 1933, where Dr. Shutt made his last public appearance as Dominion Chemist. His successor has not been appointed, as yet, and the senior assistant, C. H. Robinson, is Acting Dominion Chemist for the present.

Lasting Inspirations

Dr. Shutt received lasting inspiration from his contact with the noted chemists mentioned, and became especially interested in the value of legumes as fertilizing agents. He was, indeed, the first to establish the manurial value of clover and legumes in general for soil improvement on a firm, scientific foundation in Canada and to inform her farmers on the subject. He has insisted that the fertilizing value of legumes does not lie simply and solely in the nitrogen they contain, though therein is their chief merit. The large quantity of humus-forming material they furnish and the potash, phosphoric acid, and lime set free in their decomposition are features the significance of which should be more widely recognized. He thinks, too, that a matter closely connected with nitrification is this liberation of mineral plant food, in available form, and considers it more than probable that the two processes are coexistent and interdependent—possibly identical. His studies relative to the use of legumes as manurial agents have extended over a period of 25 years and have proved legumes to be nutritive fodders of the highest rank. His analyses have shown that from 75 to 150 lbs. of nitrogen per acre may be stored up in a season by the more common legumes, and largely due to his influence the plan of sowing clover with the cereal crops has become general in the older parts of the Do-

minion and is proving a very valuable one in the enrichment of Canadian soils.

Through the courtesy of the officers of the Central Experimental Station, Mr. B. Leslie Emslie, of Canadian Industries, Ltd., Montreal, and Mr. H. L. Trueman, general secretary of the Canadian Society of Technical Agriculturists and managing editor of "Scientific Agriculture," Ottawa, we have been privileged to examine many of Dr. Shutt's bulletins reporting on his research work. Several fine biographical sketches of that scientist, from the pen of Mr. Emslie, have also been read with pleasure and profit, and we should like to publish many items from these interesting papers did space permit. Bulletins No. 8 by Dr. Shutt and Mr. Emslie, and No. 145 by Dr. Shutt and L. E. Wright, B.Sc., Chemist, are particularly valuable. They contain a wealth of excellent material regarding plant food and fertility, farm manures, green manuring, artificial manures, commercial manures, fertilizer formulae, home-mixing, and the fertilizer needs of various crops. Silage is also fully considered in Bulletin No. 50, and soil fertility in Bulletin No. 27, second series.

Work Has Proved Great Aid

Dr. Shutt's experiments, in general, have gone far towards establishing that a judicious and rational use of fertilizers may be depended upon to yield a profit, that the exclusive use of fertilizers will neither keep up the fertility of the soil nor yield profitable returns, that it is on soils of medium rather than poor quality that a lucrative response from their employment is to be expected, and lastly, that it is on "money" crops that their application will be found most successful.

We also have been interested in Dr. Shutt's experiments relative to the causes and prevention of softness in pork, that subject likewise having engaged the attention of American chemists and animal husbandmen since the introduction and use of the soybean for hog feeding. He has reported that a tendency to softness or flabbiness is quite sufficient to rate the bacon, in the English markets, at second class prices; and if the softness is at all pronounced, the bacon is altogether unsalable at a profit. He has found that lack of thrift, from whatever cause, and immaturity are probably the two chief causes of softness, and that character of food is also an important factor. A ration composed of oats, peas, and barley, in equal parts, gives a firm pork of excellent quality. Free feeding of skimmilk tends to offset the softening influence of corn in the grain ration for pigs. Corn tends to induce softness by increasing the percentage of olein in the fat.

"A True Scientist"

Dr. Shutt's investigations of the qualities of Canadian-grown wheat have been extensive, and had much to do with the permanent establishment of Marquis wheat. He determined that, relative to the influence of environment on the protein content of wheat, the character of the season is a more important factor than the nature of the soil. The responsibility of examining flour for export, and the granting of certificates of purity, in conformity with the pure-food laws of importing countries, also have devolved upon Dr. Shutt.

For nearly 25 years he also carried on tests of sugar beets and indicated suitable areas for their successful and profitable production. His studies of the nutritive qualities of grasses at different stages of growth have been notable and have led him persistently to advise the early cutting of grass for hay to insure a high protein and low fiber content.

Mr. Emslie, who served under Dr. Shutt for seven years, said in one of his articles, "Canada possesses in Dr. Shutt a true scientist who, without fear and without reproach, has followed the truth unswervingly and

lighted the path for others. His researches comprehend all agriculture and his fame extends beyond the bounds of the Empire. He has done only what he conceived to be his duty, but he has done more than his duty, having toiled throughout his long term of office with scarce a holiday, in order that the progress of his work might be uninterrupted."

Little wonder, therefore, that he is highly esteemed, respected, and valued by his countrymen. Growing on the grounds of the Central Experimental Farm, there is a memorial oak tree, planted by Dr. Shutt, which fittingly typifies his rugged character and enduring qualities. We sincerely hope that for centuries to come it will flourish and keep green the memory of this gracious gentleman and chemist of renown.

Quality in Canning Peas

(*From page* 11)

planted to Advancer peas. The mixtures included phosphate alone, phosphate and potash, and complete goods with varying amounts of potash. Each differently fertilized plot was harvested separately and passed through the various steps of vining, processing, and cooking under standard commercial methods. The canned product in each case was stamped for identification and set aside until the grading by competent judges might be done. The fertilizer treatments and the result of the grades scored are summarized in the table:

Score-card Grades of Canning Peas

Treatment	2's	3's	4's	5's	Average
Unfertilized	76	81	81	76	78.5
0-16-0 ...	86	90	86	86	87.0
0-16-8 ...	86	86	86	76	83.5
2-16-4 ...	90	95	95	90	92.5
2-16-8 ...	90	95	90	90	91.2
2-16-12 ..	86	90	90	86	88.0
2-16-16 ..	95	95	95	90	93.7

The average of the total scores for the various sizes, 2's to 5's inclusive is shown in the column on the right. Peas from completely fertilized plots averaged above 90 with one exception, that is the 2-16-12. Stepping up the potash in increments of 4% from 4-16% did not result in any deleterious effect on the canned product notwithstanding the claims of some that potash in any amount in the fertilizer mixture would result in tough peas. On the contrary the evidence here reported, also confirmed by other investigators, indicates the need of potash in fertilizers in order to secure good quality.

Tenderness and flavor are the most important factors involved in grade designations. Judges were unanimous in marking tenderness "good" in the three commercially important sizes, 2's, 3's, and 4's for the 2-16-4, 2-16-8, 2-16-12, and 2-16-16 treatments. Except for size 3's, in the 0-16-0 and 0-16-8 treatment, also marked "good," the balance of the various siftings from different treatments were marked "fair" in tenderness.

It is not to be understood, however, that fertilizers recommended for peas should run as high as 12% to 16% of potash except possibly in special cases of potash-deficient soils. Just what constitutes a well-balanced fertilizer for the pea crop will depend largely on soil conditions. Fertilizers similar to a 2-16-8 or 3-18-9 are well adapted for Wisconsin growers.

Tough peas make an inferior product. It is difficult to differentiate between toughness due to the composition of the seed coat and that due to the physical structure of the cotyledons. Puncture testers have been used in order to test toughness. This instrument measures the pressure re-

quired to drive a small pin through the seed coat. Since the pressure exerted in puncturing the seed coat is influenced to a considerable extent by the firmness of the pea, this device has only limited value.

In connection with the general question of quality it was thought that a correlation existed between toughness of peas and the calcium content of the seed coat. Potash was reported responsible for the concentration of calcium in the skins. In order to determine whether the addition of potash influences such concentration under Wisconsin conditions, analyses were made of pea skins in which potash was a variable factor. The results are summarized in the following table:

Per cent Calcium in Dry Matter of Pea Skins

Sizes—	2's	3's	4's
Unfertilized	.151%	.178%	.208%
0-16-0 ...	.147	.167	.190
0-16-8 ...	..	.155	.176
2-16-8 ...	.145	.173	.217
2-16-16 ..	.165	.170	.200

In the table it will be noted that no consistent relation exists in the calcium of the pea skins between an 0-16-0 and a complete fertilizer with varying amounts of potash. In the 0-16-8 plot less calcium was found in the 3's and 4's than where the straight phosphate was used. In the 3's the highest calcium is found in the unfertilized, and in the 4's this occurs in the 2-16-8 plot. There is, however, a progressive increase in the calcium content of pea skins with increase in sizes. This holds true in all cases whether fertilized or not. In general there appears to be no relationship between potash in the fertilizer mixture and the concentration of calcium in the seed coats.

The condition known as tough peas is unquestionably linked up with many factors. The stage of maturity when the crop is harvested, the time elapsing between vining and canning, temperature conditions at harvesting time, and perhaps other factors are involved. That any fertilizer constituent is responsible for inferior quality may be dismissed from consideration. Well-balanced mixtures may be depended upon to improve rather than to reduce quality.

Balanced Fertilizers for Fruit

(*From page* 10)

disease-free trees. Diseased trees also showed much less potassium in the roots than in those of disease-free trees, and a much greater accumulation of starch was found in the roots of the diseased trees than in those trees not showing the disease. We can not, therefore, concede at present that this trouble is due solely to a soil-moisture condition or a soil condition over which man has no control.

In further support of this, let me finally present data from some trees grown in sand cultures in pots under constant moisture conditions.

The variety is Melba; the treatment consists of feeding nitrogen for varying periods throughout the growing season. Where late or prolonged feeding of nitrogen was given, cork mounted to as high as 100%; thus, when nitrogen was fed only until the trees were in full bloom, the amount of cork was 6%; when fed until after the calyx spray it rose to 15%; when fed until September 1 it rose to 100%.

The question of excess or lack of moisture did not enter here, so we are obliged to seriously consider the question of unbalanced nutrition as one of

the more important causes of these disorders.

With reference to the question of endeavoring to raise production to excessive heights by the use of nitrogenous fertilizers, Wallace says that in addition to the tree being driven into excessive growth, fruiting may be reduced, fruit size decreased, and the tree may become affected with nutritional disorders such as leaf scorch or diseases such as scab, canker, and die-back.

We have repeatedly observed that spray injury is more abundant on high-nitrogen trees than on low, and die-back is becoming quite prevalent in the eastern fruit sections of this continent.

The statement of many people that potash deficiency does not exist in Canada is far from the fact. There are numerous examples of orchards that are on the verge of it and the worst case of potash deficiency I have ever seen in my life exists in the Niagara peninsula of Ontario. This area has been planted twice to peaches and ripped out because the trees made very poor growth and produced little fruit and what they did produce was of extremely poor quality and ripened prematurely and unevenly. A portion was recently planted to apples and Figure No. 2 will show you the foliage condition in this young apple orchard. By paring away the soil in the spring of 1933 and applying potash, response was obtained in one season as indicated by commencement of growth and return of normal foliage. For some years this condition was baffling, and the continued use of nitrogenous fertilizers did but aggravate the situation.

Telltale Signs

I now come to our final recommendations, which largely consist of using the symptoms of the tree as an index to its requirements. In the case just cited the leaf-scorch symptoms indicated the soil requirements, and when attention was paid to the distress signals, results were obtained.

Potash deficiency is first noticed by a very dark leaf, generally lacking lustre. This condition may be overlooked but is soon followed either by a faint chlorosis around the margin or at the tip or sometimes by a slight scorching or burning of the tip of the leaf. In bad cases the scorching is around the entire margin, and when it reaches that stage, can not be mistaken.

In operating an orchard it is better to have your leaves on the slightly pale green side than on the extremely dark green side. The latter condition indicates excessive nitrogen and it indicates you are close to the border line of excess nitrogen over potassium unless you have an abnormally high potassium content in your soil.

Fertilize Accordingly

In our opinion, it is unwise to ignore the application of potassic fertilizers, especially where nitrogen is in use, and we would recommend growers to watch their foliage, color, and twig growth and regulate their fertilizer needs by varying their nitrogen applications while applying yearly amounts of about 200 pounds per acre of potassium fertilizer.

Phosphorus deficiency is readily recognized by the bronzing of the foliage. This bronzing may be accompanied by a certain amount of purpling, but the bronzing is always present if phosphorus is really deficient.

Calcium and magnesium deficiency, if present, are recognized by the edge, or sometimes the center, blotching, consisting of brown areas on the margin or in the center of the leaves. The two produce similar symptoms and are very difficult, if not impossible, to distinguish from each other. It is not probable that you have either of these deficiencies in your orchards, although excess feeding of potassium might induce a low-magnesium condition and, if aggravated enough, a low-calcium condition. Low magnesium, due to excess potassium, is more likely than

low calcium, but we can not say we have seen such a case under practical conditions.

By carefully watching foliage and tree characters, the grower can do much to adjust his fertilizer practice to his needs. Trees carrying large-size, dark green leaves and making good growth while bearing a crop are on the high-nitrogen side; cut down on your nitrogen applications. When foliage starts to become pale or light green, it is time enough to start worrying about your nitrogen supply.

No good rule-of-thumb method for year in and year out fertilizer treatment can be given, but where a grower feels that he must use such a rule, our advice is to continue with a complete fertilizer of the 9-5-7 type rather than to adhere to nitrogen alone.

Country-Minded?

(*From page 6*)

to farm folks is the kind that is paid in cash. That is a trifle unjust. If that were the case why do we not find more expert bookkeepers and checkers totaling up the assets and liabilities on farms? Why do we not find more rural Shylocks who have grown rich on seven or eight per cent, or even loan-shark rates? The real reason why the chief answer in economic discussions in the country is to pay up and shut up is that they want you to *shut up*. It is not that they are more mercenary than other people. Their mental brushes paint larger pictures. Details irk them. Tables that do not groan with food or drink are useless to them. That's all.

I REALIZE that if they had had more schooling in sound economics they would be the rulers of the universe instead of the takers of dole. But as long as we have no united economic platform and the doctors can't agree among themselves, why pick on the farmers?

I believe that the majority of farmers do not wish to follow unsound theories or the hobbies of seekers after glory. If and when the leaders emerge with a plan that they agree upon and which has in it the elements of justice, the economic weakness of the farmer will fade. Does that take more courage than political pressure can provide? Time will tell.

One might carry this discussion through other things such as the taste for art and beauty and the love of humanity, but it is unfair to present one side of the picture only. For one can be country-minded and get wrong notions which take root as vigorously as quack-grass.

One of the bad habits of country-minded folks is often called inferiority complex. Some of my own people had extreme cases of it, and occasionally I catch myself up short indulging in it a little. This is a queer blend of conceit and a desire to show off, mixed with a native shrinking, a painful fear that somebody is looking down on your efforts and discounting you.

How natural it is for rural workers to acquire this blight! They become skilled in various tasks, confident of their ability in the shelter of the farmstead to perform as well as any other person. Yet in the presence of some sophisticated group, or thrust into a prominent position of public responsibility, a strange quaking and panic forces them to submerge themselves and allow people of less training or equipment to run the show.

And again this same complex works the other way. It banishes a man's real judgment of values and the fit-

ness of things. He goes into a trance and overdoes the job horribly, making a farce and a nervous outburst out of what should have been done calmly and well. Of such stuff are made many of the radical spokesmen who often injure the cause of agriculture and label it with wild-eyed terrorism.

Another fault in country-mindedness comes as a relic of the copybook days. It is using sentiment when hard sense would fill the bill to better advantage. Take the case of consumers versus producers. We see some farm folks lined up on one side and some on another, all slopping sentiment into the discussion where it does not belong. My uncle would get tearful over the dear old farm and its God-given heritage as the foundation of world happiness and security, and argue that all non-farmers were parasites. On the other hand, a weepy rural aunt of mine of late has lamented about the slaughter of the little pigs and the talk of curtailing the milk supply when so many babies were going hungry. Wasting time lamenting such things when consumers are producers and producers are consumers, separated by a widening gap of speculative and service-catering agencies, is like trying to put out a prairie fire with dew.

IN summary, it seems to me that by and large one unfailing trait that makes country-minded folks stand out is a reserve power of patience and a willingness to bide awhile before the millennium comes. It is sheer conservatism rising from conditions that in many places in cities breeds revolution.

The age-long struggle against bugs, blight, frost and flood, hail, and marauding animals rather makes for a stoic sort of inward philosophy. I often wonder how much this has contributed in this country to the relative calmness of our people during the depression, even in the cities. Our cities trace the largest share of their population, at one time or another, to the soil. Some remnant of the spirit which accepts things as inevitable and gives folks endurance to meet tribulations no doubt has its origin in country life.

Coming out of that same trait in the country mind is the saving grace of humor. There is more broad, rail-splitting, man's-sized appreciation of the ridiculous and the laughable amid our country communities than anywhere else. Maybe it is that homeopathic mental method of treating our ills with a dose of risibility which enables me to accept the crowded streetcar, the fly-specked lunch counter, the traffic policeman waving six ways at once, and the mistakes of the janitor with such ease.

After all, history usually teaches us that more things are a joke than ever we thought were while they were happening. We grin at the styles in autos and human dress as they flash at us from some relic of the early days of motion pictures, and we find the policies and platforms of past campaigns and the speeches of former industrial barons extremely funny now. But those are mostly city scenes and city programs, and if you try to check back on the life of country communities a couple of decades ago, no such startling changes of patterns are evident. The farmer laughs it off, goes his way undisturbed to any great extent by innovations, and adheres to the fundamental principles of thinking and acting which always have been his custom.

SO maybe the country mind is one that has been ventilated and insulated, and escapes some of the contagion and the false attitudes of the moment. At least we who think we have it yearn to mingle with those who possess it, and we long to live once more under the sky and the stars, clasping the plow handles, feeding the livestock, braving the elements—with the mortgage and the tax bill as the only reminders of Adam's original sin.

LOSS OF INTEREST

A Negro, applying for work, had a face so battered that one might have been pardoned for assuming that its owner had been run over by a steam roller.

"Good heaven!" cried the foreman: "what have you been doing to yourself?"

"Me? I ain't been doin' nothin' to myself," explained the Negro. "It's lak dis. Yistiddy I got into a kind of ahgyment wid anothah cullud man, an' one word led to anothah.

"Purty soon I up an' hit at him wid my fist. Well, seemed lak dat irritated him. So he split my lip, an' he blacked dis eye of mine, an' den, to cap all, he knocked me down and stomped up an' down on my stomach wid his feet. . . . Honest, I never did git so sick of a man in all my life!"

The bride of three months timidly asked her husband:

"Dearest, will you please give me some money for a new dress?"

"Sure," said he generously. "Here's five dollars, get a hat, too."

Advertisement: "Wanted — Small apartment by couple with no children until May 1."

TIME OUT

Parson: "Do you take this woman to be your lawful wedded wife till death do you part?"

Bridegroom: "Don't I get any time off for good behavior?"

CONFUSING

"Now, sir," said the counsel to the witness, "did you, or did you not, on the date in question, or at any time, previously or subsequently, say or even intimate to the defendant or anyone else, whether friend or mere acquaintance, or in fact, a stranger, that the statement imputed to you, whether just or unjust, and denied by the plaintiff, was a matter of no moment or otherwise? Answer—did you or did you not?"

"Did I or did I not what?" asked the witness weakly.

SIN TAX

Prof.: "What do you know of Latin Syntax?"

Frosh: "Did they have to pay for their fun, too?"

Sam (to wife at show): "Mandy, tell dat Niggah to take his ahm away from 'round yo' waist."

Mandy: "Tell him you'self. He's a puffect stranger to me."

She: "Oh, Henry, there's a bug down my back."

He: "Aw, cut it out. Those jokes were all right before we were married."

A man may be truthful in everything else, but he always played a better game of golf several years ago than he does now.

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